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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
HINES, JANA A	

ART UNIT	PAPER NUMBER
1645	

DATE MAILED: 01/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/694,546	GU ET AL.	
	Examiner	Art Unit	
	Ja-Na Hines	1645	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 September 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7* is/are pending in the application.

4a) Of the above claim(s) *7* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group I in the reply filed on September 26, 2005 is acknowledged. Claim 7 has been withdrawn from consideration. Claims 1 – 6 are under consideration in this office action.

Specification

2. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1-6 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. This is a written description rejection.

Claim 1 is drawn to a recombinant vector for transforming a strain to detect benzoic acid and derivatives comprising a bioluminescent gene and a gene set inducing

the expression of the bioluminescent gene wherein the gene set includes regulatory gene nagR and a promoter region inducing the transcription of the bioluminescent gene via the action of the protein NagR encoded by the gene nagR. The written description in this case only sets forth specific compounds, see Table 1, however there are more derivatives of benzoic acid than those named; yet the specification makes no references to detecting these compounds. Therefore the written description is not commensurate in scope with the claims drawn to derivatives of benzoic acid. Neither the specification nor the claims teach how to define the derivatives. Neither the claims nor the specification teach how to detect all derivatives. There is no guidance as to whether derivatives such as aspirin, cocaine, ethylpapraben or other such compounds can be detected. Thus, the resulting derivative could result in a complexes not taught and enabled by the specification.

Vas-Cath Inc. V. Mahurkar, 19 USPQ2d 1111, clearly states that "applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession *of the invention*. The invention is, for purposes of the 'written description' inquiry, *whatever is now claimed*." (See page 1117). The specification does not "clearly allow persons of ordinary skill in the art to recognize that [he or she] invented what is claimed." (*See Vas-Cath* at page 1116).

Applicant is reminded that *Vas-Cath* makes clear that the written description provision of 35 USC 112 is severable from its enablement provision (see page 115).

With the exception of specifically named benzoic salicyclic acid compounds, the skilled artisan cannot envision the detailed structure of the derivatives, thus conception is not achieved until reduction to practice has occurred, regardless of the complexity or simplicity of the method of isolation. An adequate description requires more than a mere statement that it is part of the invention and a reference to a potential method of

isolating it. Furthermore, *In The Reagents of the University of California v. Eli Lilly* (43 USPQ2d 1398-1412), the court held that a generic statement which defines a genus of by only their functional activity does not provide an adequate description of the genus. The court indicated that while Applicants are not required to disclose every species encompassed by a genus, the description of a genus is achieved by the recitation of a representative number of molecules falling within the scope of the claimed genus.

Therefore only the recited antibiotics and not the full breadth of the claims meets the written description provision of 35 USC 112, first paragraph.

4. Claims 4-6 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. This is a deposit rejection.

The specification lacks complete deposit information for the deposit of the recombinant vector having the cleavage map shown in Figure 1 and is pNAG1 wherein the *E.coli* is RFM 443 and the transformant EBNAG1 (KACC 91044). Because it is not clear that cell lines possessing the properties of the recombinant vector having the cleavage map shown in Figure 1 and is pNAG1 wherein the *E.coli* is RFM 443 and the transformant EBNAG1 (KACC 91044) are known and publicly available or can be reproducibly isolated from nature without undue experimentation and because the claims require the use of the recombinant vector and transformant, a suitable deposit for

patent purposes is required. Without a publicly available deposit of the above cell line, one of ordinary skill in the art could not be assured of the ability to practice the invention as claimed. Exact replication of the cell line is an unpredictable event.

If a deposit has been made under the provisions of the Budapest Treaty, filing of an affidavit or declaration by applicant or assignees or a statement by an attorney of record who has authority and control over the conditions of deposit over his or her signature and registration number stating that the deposit has been accepted by an International Depository Authority under the provisions of the Budapest Treaty, that all restrictions upon public access to the deposit will be irrevocably removed upon the grant of a patent on this application and that the deposit will be replaced if viable samples cannot be dispensed by the depository is required. This requirement is necessary when deposits are made under the provisions of the Budapest Treaty as the Treaty leaves this specific matter to the discretion of each State. Amendment of the specification to recite the date of deposit and the complete name and full street address of the depository is required.

If the deposit has not been made under the provisions of the Budapest Treaty, then in order to certify that the deposits comply with the criteria set forth in 37 CFR §1.801-1.809, assurances regarding availability and permanency of deposits are required. Such assurance may be in the form of an affidavit or declaration by applicants or assignees or in the form of a statement by an attorney of record who has the authority and control over the conditions of deposit over his or her signature and registration number averring:

(a) during the pendency of this application, access to the deposits will be afforded to the Commissioner upon request;

(b) all restrictions upon the availability to the public of the deposited biological material will be irrevocably removed upon the granting of a patent on this application;

(c) the deposits will be maintained in a public depository for a period of at least thirty years from the date of deposit or for the enforceable life of the patent of or for a period of five years after the date of the most recent request for the furnishing of a sample of the deposited biological material, whichever is longest; and

(d) the deposits will be replaced if they should become nonviable or non-replicable.

In addition, a deposit of biological material that is capable of self-replication either directly or indirectly must be viable at the time of deposit and during the term of deposit. Viability may be tested by the depository. The test must conclude only that the deposited material is capable of reproduction. A viability statement for each deposit of a biological material not made under the Budapest Treaty must be filed in the application and must contain:

1) The name and address of the depository;
2) The name and address of the depositor;
3) The date of deposit;
4) The identity of the deposit and the accession number given by the depository;
5) The date of the viability test;
6) The procedures used to obtain a sample if the test is not done by the depository; and
7) A statement that the deposit is capable of reproduction.

As a possible means for completing the record, applicant may submit a copy of the contract with the depository for deposit and maintenance of each deposit.

If the deposit was made after the effective filing date of the application for patent in the United States, a verified statement is required from a person in a position to corroborate that the recombinant vector and the transformant EBNAG1 (KACC 91044) described in the specification as filed is the same as that deposited in the depository. Corroboration may take the form of a showing of a chain of custody from applicant to the depository coupled with corroboration that the deposit is identical to the biological

material described in the specification and in the applicant's possession at the time the application was filed.

Applicant's attention is directed to *In re Lundack*, 773 F.2d. 1216, 227 USPQ 90 (CAFC 1985) and 37 CFR §1.801-1.809 for further information concerning deposit practice.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burlage et al., in view of Jones et al.

The claims are drawn to a recombinant vector for transforming a strain to detect benzoic acid and derivatives comprising a *lux*CDABE bioluminescent gene and a gene set inducing the expression of the bioluminescent gene wherein the gene set includes regulatory gene nagR and a promoter region inducing the transcription of the bioluminescent gene via the action of the protein NagR encoded by the gene nagR.

Burlage et al., teach monitoring of naphthalene catabolism by bioluminescence with *nah-lux* transcriptional fusions. NAH7 is the promoter containing *nah* operon used for the catabolism of naphthalene in *Pseudomonas*. In *V. fischeri*, the *lux* genes are organized in the *lux*CDABE operon (page 4749). This report describes the fusion of the

lux genes of *Vibrio fischeri* to a promoter plasmid NAH7, demonstrating the efficacy if this light-producing system, and the use of this reporter to facilitate both biochemical and environmental study (page 4749). The promoter is recognized by the *nahR* gene product, which is the only known regulatory gene for these operons (page 4749). The NahR protein binds to this site and activates transcription (page 4749). The promoter has good homology to *E. coli* promoters as well as to the *nahR* promoter and therefore this promoter would be as active as the *nahR* promoter (page 4755). Figure 1 shows the recombinant plasmid and cleavage map cloned into the *lux* vector pUCD615 (page 4751). The plasmid being *E.coli* cells produce light at high levels when induced with an appropriate substrate (page 4749). This procedure transformed *E. coli* (page 4750). The plasmid being *E.coli* cells produce light at high levels when induced with an appropriate substrate (page 4749). However, Burlage et al., do not teach the inclusion of the *nagR* gene.

Jones et al., teach *nag* genes code for the catabolism of naphthalene in the *Ralstonia* (formerly *Pseudomonas*) species strain U2 (page 5847). Naphthalene is also encoded by the *nah* genes (page 5847). Transcriptional control of the classical naphthalene pathway is regulated by *nahR,* a regulator protein (page 5847). This arrangement is found in several different bacteria (page 5847). The nag pathway also contains a putative regulator gene, *nagR*, which has high sequence similarity to *nahR* (page 5847). The *nagR* is the regulatory gene which controls nag gene expression (page 5847). The construction of the recombinant vector includes a region for the nag promoter (page 5849).

Therefore it would have been prima facie obvious at the time of applicants' invention to modify the recombinant vector of Burlage et al., in include the *nagR* gene of Jones et al. There would have been a reasonable expectation of success since Burlage et al., already teaches creating recombinant vectors comprising luxCDABE bioluminescent genes and a gene set which includes regulatory naphthalene genes and a promoter and the instant invention only exchanges one naphthalene gene set for another. Moreover, no more than routine skill would have been required to replace the nah genes of Burlage et al., which nag genes of Jones, since both gene sets are known to catabolize naphthalene and no more than routine skill is required to exchange an equivalent yet alternative gene set, one for the other.

Prior Art

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Heitzer et al., teach specific and quantitative assessment of naphthalene and salicyate bioavailability by using a bioluminescent catabolic reporter bacterium. King et al., teach rapid, sensitive bioluminescent reporter technology for naphthalene exposure and biodegradation.

Conclusion

7. No claims allowed.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ja-Na Hines whose telephone number is 571-272-0859. The examiner can normally be reached on Monday-Thursday and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynette Smith can be reached on 571-272-0864. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ja-Na Hines

December 29, 2005

MARK NAVARRO
PRIMARY EXAMINER